

is very great, and even that in many points the Walrus and the *Otariæ* agree more with *Lutra* than with the *Phocina*. But the author cannot find in this an uninterrupted transition from the *Feræ*, through the *Lutrina*, to the *Pinnipedia*, but shows that, independently of the dentition, the *Pinnipedia* are rather allied to the Bears by other anatomical peculiarities, such as the development of a hooked process of the lower jaw and the racemose construction of the kidneys. Hence he thinks that the question of the retention or abolition of the *Pinnipedia* as a separate group must depend solely upon individual opinions which hardly admit of discussion.—*Monatsber. der Akad. der Wiss. zu Berlin*, December 1864, p. 685.

*Second Note on the Metamorphoses of Marine Crustacea.*

By M. Z. GERBE.

In a second note on *Phyllosoma*, M. Gerbe describes the internal anatomy of the Crustaceans composing that supposed genus.

The digestive apparatus consists, as in all Crustacea, of a mouth, œsophagus, stomach, and intestine, with peculiar glands attached to the latter; but the arrangement of these parts is different from that occurring in the adult, as also in other larvæ.

The mouth, situated about the posterior third of the cephalic shield, is circumscribed by a languette and a bifid labium, and by two mandibles. These are followed posteriorly by two pairs of maxillæ and three pairs of footjaws, placed upon two lateral diverging lines. The appendages representing the first pair of footjaws are reduced to scarcely perceptible tubercles, almost confounded with the base of the second maxillæ; those of the third pair, on the contrary, are greatly developed and furnished with flagelliform appendages, and perform the function of natatory feet, which they precisely resemble in organization.

The œsophagus is short, cylindrical, and directed obliquely from behind forwards; it communicates with the front of the stomach by an aperture in the form of an X, formed by a triangular lip moved by two very long and slender muscles, which are attached near the ocular peduncles. This arrangement seems to be peculiar to the Phyllosomes; nothing of the kind has been observed in the larvæ of *Cancer*, *Maia*, *Porcellana*, *Palæmon*, &c. In these larvæ the œsophagus, at its junction with the stomach, only presents a sort of constriction, which dilates and contracts by the action of circular muscles.

In all these larvæ, moreover, the front of the stomach nearly touches the ocular peduncles, as in the adults, and only occupies a very small portion of the cephalic region. Its general form is that of an almond; so that it is rather compressed than globular, and presents two unequal extremities, the anterior of which is the larger. In this form its structure is already very complicated, especially in the larvæ of *Homarus*, *Porcellana*, and *Palæmon*. Its double, muscular and mucous wall is supported by several cartilaginous pieces of extreme transparency. Two of these, forming the floor, articu-

lated to each other, moveable, and projecting internally, are armed with stiff bristles, regularly arranged in rows, like the hairs of a brush. Other hairs, of larger size and more flexible, spring from the roof of the organ, and from its pyloric appendages. Lastly, its cavity may be divided into two distinct compartments, viz. a short, narrow one, nearly cylindrical, immediately following the œsophagus, and a larger one, anfractuous in form, which communicates with the intestine by a contractile circular orifice, surrounded by projecting, ciliated, pyramidal languettes. Thus in most larvæ, both of *Brachyura* and *Macrura*, the stomach agrees in structure and position with that of the adult animal.

In the *Phyllosomes* the stomach is comparatively smaller, and more elongated and compressed. Instead of being close to the ocular peduncles, it occupies the posterior third of the cephalic buckler. From the upper lamina of this buckler it is separated only by the median or ophthalmic artery; its lateral surfaces are entirely free, and its lower surfaces rest partly upon the œsophagus. Its cavity is quite undivided; and its walls, formed by a muscular and a mucous layer, are sustained only by extremely simple cartilaginous laminæ. But it presents the stiff bristles which spring from the projecting laminæ of the *Zoëas*, &c., and the vibratile cilia which keep the organic molecules of the animal's food in constant rotation. It also presents the six pyramidal villous languettes surrounding the pyloric orifice, and projecting into the intestine. This structure of the pylorus seems to be common to the larvæ of *Decapoda*.

The same comparative simplicity of structure is presented by the intestine of the *Phyllosomes*. It extends in a straight line from the pylorus to the anus; it is slender, with its walls a little thicker than those of the stomach; it is nearly of the same size throughout, but is divided by a valvular constriction into two distinct portions, of which the anterior, which is very long, represents the duodenum, and the posterior, very short, the rectum. The latter terminates in an oblique, oblong anal orifice, furnished with two lips moved by numerous and powerful muscles, which are attached to the sides of the last segment.

In the *Brachyura* and some *Macrura*, the intestine, at birth and even during the ovarian evolution of the embryo, presents, at the pyloric region and at the extremity of the duodenal portion, some small ampullæ, which, by subsequent development, become the long membranous appendages of the intestine in the adult. The *Phyllosomes* present nothing of the sort, and the *liver* is the only secretory organ of the digestive apparatus.

In larvæ of which the development is not far advanced, this organ consists of two simple short cæca, springing from the pyloric region at the point where the double vitellary duct of the umbilical vesicle opens, and lying upon the lateral and anterior portions of the cephalic buckler. During development these cæca soon bifurcate, and the two canals thus produced pass between the laminæ of the anterior buckler. The inner canal, as it enlarges, becomes dilated into a

clavate form ; the outer canal undergoes more profound modifications. From its outer border a series of secondary cæca soon arises, and these elongate and become subdivided, until the whole resembles a double, hollow, palmated organ, with its trunks slightly flexuous. The organization of this primitive liver appears to be very simple ; the walls of its numerous tubes are delicate and transparent, and formed of two layers analogous to those of the intestine, which they also resemble in the faculty of contraction and dilatation. The liver of the other Crustacean larvæ, however different in arrangement, has the same origin and organization ; it may be seen alternately extremely dilated and much contracted. The larvæ of *Mysis* and *Porcellana* are particularly remarkable in this respect.

The liver, consequently, is here a diverticulum appended to the intestinal canal ; and at this period the communications between the two organs are so wide, that the nutritive molecules poured by the umbilical vesicle into the cavity of the intestine pass freely from the latter into the future biliary ducts, and *vice versa*, as they are impelled by the contractions of those organs. It is difficult to say whether, at this point of organization, the liver furnishes any products of secretion to the intestine. If such products exist either in the cæca of the gland or in the intestine, they are so scanty and colourless as to be inappreciable.—*Comptes Rendus*, January 9, 1865, p. 74.

*Note on a new Case of Reproduction by Gemmation observed in an Annelide of the Gulf of Suez.* By M. L. VAILLANT.

The animal observed by the author belongs to the group of Syllidians, but is not further determined. It is only a little more than four millimètres in length, and presents eight segments, each having a pair of cirri, furnished with eight or ten smooth setæ upon two-thirds of their length, and bristling with small verticillated spines in their terminal third. In front, upon what was apparently the dorsal side, there was a process in the form of a rounded leaf, beneath which was a bundle of tentacles and the buccal aperture. The little animal was found in a cavity of a Sponge.

The segment which bears the leaf-like process presents the most important modifications. It is much broader than the rest of the body, and forms a sort of cup or funnel, compressed from the ventral to the dorsal surface, so as to represent two thick lips, of which the lower is smooth and simple, whilst the upper one is covered with an immense number of buds, placed very close together, and inserted quincuncially.

These buds have a very remarkable form, resembling that of some low forms of Annelides allied to *Nemertes* or *Planaria*. They have a very contractile body, nearly equal in length to that of the parent animal, flattened and obtuse at the free extremity, where they present two or four small black oculiform points. They present only an annulated integument and a few cell-nuclei in the more advanced individuals. Towards the point of attachment, the body becomes